1   transmitting the continuous phase modulated signal,

2   receiving the continuous phase modulated signal,

3   [demodulating the continuous phase modulated signal into a

4   received baseband signal,] and

5   filtering the [received baseband] continuous phase modulated

6   signal into a sequence of filtered signals having absolute phase

7   for indicating the sequence of data symbols.

8

9   2.   (Once Amended) The method of claim 1 further comprising the

10   steps of ,

11   sampling the sequence of filtered signals into a sequence of

12   sampled [signals] symbols, and

13   [decoding] demodulating the sequence of sampled symbols

14   [signals] into an estimated data stream.

15

16   3. (Once Amended) The method of claim 1 wherein,

17   the generating step comprises the steps of receiving the data

18   stream of data bits, formatting the data stream into the sequence

19   of formatted data pulses as a sequence of data symbols within an M-

20   ary symbol set,

21   the modulating step comprises the steps of Gaussian filtering

22   and frequency modulating for generating the continuous phase

23   modulated signal, the Gaussian filter step filters the precoded

24   sequence of data symbols into pulse responses continuously

25   accumulated over a finite memory time as a filter response, the

26   Gaussian filtering step is defined by a bandwidth time product

27   inversely defining the finite memory time, the frequency modulating

28   step frequency modulates a carrier reference by the filter response

by a modulation index for converting the filter response into the
continuous phase modulated signal,

the [demodulating step is carrier demodulating step for
demodulating the] continuous phase modulated signal is up converted
from baseband during the transmitting step and is down converted to
baseband during the receiving step using a local carrier [into the
baseband signal, the carrier demodulating step further removes a
carrier phase offset between the local carrier and the received
continuous phase modulated signal], and

the filtering step is a matched filtering step for matched
filtering of the received [baseband signal] continuous phase
modulated signal into the filtered signal, the matched filtering is
matched by pulse amplitude modulation representation to the
Gaussian filtering step, the filtered signal has an absolute phase
at a periodic sampling time for indicating the sequence of data
symbols.

4.(Twice Amended) The method of claim 3 wherein,

the modulation index is equal to a fraction selected from a
group consisting of 1/M and (1-1/M) fractions for the M-ary symbol
set where $M=2^k$ and k is an integer.

5. (Twice Amended)   A method for communicating a data stream, the
method comprising the steps of,

generating a sequence of data symbols from the data stream by
formatting the data stream into the sequence of formatted data
pulses as a sequence of data symbols within a 2-ary symbol set,

1   precoding the sequence of data symbols into a sequence of

2 precoded data symbols,

3   Gaussian filtering the precoded sequence of data symbols into

4 pulse responses continuously accumulated over a finite memory time

5 as a filter response, the Gaussian filtering is defined by a

6 bandwidth time product inversely defining the finite memory time,

7   frequency modulating a carrier reference by the filter

8 response by a modulation index for converting the filter response

9 into a continuous phase modulated signal,

10   [demodulating the continuous phase modulated signal by a local

11 carrier and by a carrier phase offset into a received baseband

12 signal,] and

13   matched filtering the received [baseband signal] continuos

14 phase modulation signal into a filtered signal, the matched

15 filtering is matched by pulse amplitude modulation representation

16 to the Gaussian filtering, the filtered signal has an absolute

17 phase at a periodic sampling time for indicating the sequence of

18 data symbols.

19

20 11. (Twice Amended) A method for communicating a data stream, the

21 method comprising the steps of,

22   generating a sequence of data symbols from the data stream by

23 formatting the data stream into the sequence of formatted data

24 pulses as a sequence of data symbols within a[n] 4-ary symbol set,

25   precoding the sequence of data symbols into a sequence of

26 precoded data symbols,

27   Gaussian filtering the precoded sequence of data symbols into

28 pulse responses continuously accumulated over a finite memory time

-4-

as a filter response, the Gaussian filtering is defined by a

bandwidth time product inversely defining the finite memory time,

frequency modulating a carrier reference by the filter

response by a modulation index for converting the filter response

into a continuous phase modulated signal,

[demodulating the continuous phase modulated signal by a local

carrier and by a carrier phase offset into a received baseband

signal, and]

matched filtering the [received baseband signal] continuous

phase modulated signal into a filtered signal, the matched

filtering is matched by pulse amplitude modulation representation

to the Gaussian filtering, the filtered signal has an absolute

phase at a periodic sampling time for indicating the sequence of

data symbols, and

demodulating the sequence of data symbols into an estimate of

the data steam.

///

1. (Once Amended and Rewritten) A method for communicating a data stream, the method comprising the steps of,

generating a sequence of data symbols from the data stream,

precoding the sequence of data symbols into a sequence of precoded data symbols,

modulating the sequence of precoded data symbols into a continuous phase modulated signal,

transmitting the continuous phase modulated signal,

receiving the continuous phase modulated signal, and

filtering the continuous phase modulated signal into a sequence of filtered signals having absolute phase for indicating the sequence of data symbols.

2. (Once Amended and Rewritten) The method of claim 1 further comprising the steps of ,

sampling the sequence of filtered signals into a sequence of sampled signals, and

demodulating the sequence of sampled signals into an estimated data stream.

///

3. (Once Amended and Rewritten) The method of claim 1 wherein,

the generating step comprises the steps of receiving the data stream of data bits, formatting the data stream into the sequence of formatted data pulses as a sequence of data symbols within an M-ary symbol set,

the modulating step comprises the steps of Gaussian filtering and frequency modulating for generating the continuous phase modulated signal, the Gaussian filter step filters the precoded sequence of data symbols into pulse responses continuously accumulated over a finite memory time as a filter response, the Gaussian filtering step is defined by a bandwidth time product inversely defining the finite memory time, the frequency modulating step frequency modulates a carrier reference by the filter response by a modulation index for converting the filter response into the continuous phase modulated signal,

the continuous phase modulated signal is up converted from baseband during the transmitting step and is down converted to baseband during the receiving step using a local carrier, and

the filtering step is a matched filtering step for matched filtering of the received continuous phase modulated signal into the filtered signal, the matched filtering is matched by pulse amplitude modulation representation to the Gaussian filtering step, the filtered signal has an absolute phase at a periodic sampling time for indicating the sequence of data symbols.

/ / /

1   4.(Twice Amended and Rewritten) The method of claim 3 wherein,

2   the modulation index is equal to a fraction selected from a

3   group consisting of 1/M and (1-1/M) fractions for the M-ary symbol

4   set where M=2^k and k is an integer.

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8   5. (Twice Amended and Rewritten)   A method for communicating a

9   data stream, the method comprising the steps of,

10   generating a sequence of data symbols from the data stream by

11   formatting the data stream into the sequence of formatted data

12   pulses as a sequence of data symbols within a 2-ary symbol set,

13   precoding the sequence of data symbols into a sequence of

14   precoded data symbols,

15   Gaussian filtering the precoded sequence of data symbols into

16   pulse responses continuously accumulated over a finite memory time

17   as a filter response, the Gaussian filtering is defined by a

18   bandwidth time product inversely defining the finite memory time,

19   frequency modulating a carrier reference by the filter

20   response by a modulation index for converting the filter response

21   into a continuous phase modulated signal, and

22   matched filtering the received continuos phase modulation

23   signal into a filtered signal, the matched filtering is matched by

24   pulse amplitude modulation representation to the Gaussian

25   filtering, the filtered signal has an absolute phase at a periodic

26   sampling time for indicating the sequence of data symbols.

27

28   ///

1   11. (Twice Amended and Rewritten) A method for communicating a

2   data stream, the method comprising the steps of,

3   generating a sequence of data symbols from the data stream by

4   formatting the data stream into the sequence of formatted data

5   pulses as a sequence of data symbols within a 4-ary symbol set,

6   precoding the sequence of data symbols into a sequence of

7   precoded data symbols,

8   Gaussian filtering the precoded sequence of data symbols into

9   pulse responses continuously accumulated over a finite memory time

10   as a filter response, the Gaussian filtering is defined by a

11   bandwidth time product inversely defining the finite memory time,

12   frequency modulating a carrier reference by the filter

13   response by a modulation index for converting the filter response

14   into a continuous phase modulated signal,

15   matched filtering the continuous phase modulated signal into a

16   filtered signal, the matched filtering is matched by pulse

17   amplitude modulation representation to the Gaussian filtering, the

18   filtered signal has an absolute phase at a periodic sampling time

19   for indicating the sequence of data symbols, and

20   demodulating the sequence of data symbols into an estimate of

21   the data steam.

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